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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,010	01/31/2002	Seyed R. Zarabadi	DP-306551	5543

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EXAMINER
HANLEY, JOHN C

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/059,010	ZARABADI ET AL.	
	Examiner	Art Unit	
	John C Hanley	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed January 31, 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered with regard to the two publications struck out on the enclosed copy of the disclosure statement, since these references were not provided with the other references.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 14, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 4 and 14, "centrally located" is a relative phrase with no structural relation. Centrally located to what? In claim 18, "one tether for each" is a vague and indefinite functional limitation. It is structurally unclear why a tether is "for" a plate. It would appear that the tethers collectively function only as a support for the overall movable mass.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 5-13, and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al (US 5,707,077) in view of Zerbini et al (US 6,508,124).

6. Yokota et al show a substrate 1 (and 2/3) formed of silicon, a plurality of fixed capacitor plates 7, a generally ring-shaped inertial mass 5 suspended over a cavity and having a plurality of movable capacitor electrodes or plates 12 at the outer perimeter, a central member 9 located in a central region of the inertial mass 5, and four support arms or tethers 10 extending between the central support and the inertial mass, and extending perpendicularly to the sensing axis so as to be flexible in a sensing direction, but rigid in non-sensing directions. Electrodes 8 serve as inputs and outputs for the sensor. Etching is used to fabricate the device. Yokota et al lacks only the details of the plurality of capacitor plates for each capacitor electrode, or "comb" structured capacitor banks, and the particular overall shape of the movable mass. Zerbini et al, Figure 13, shows a linear accelerometer having an inertial mass 71 supported by tethers 72 connected to a central support 83. Zerbini et al is cited particularly for its use of four capacitor banks having a plurality of capacitor plates in each bank forming a "comb" type electrode structure to interact with a similar structure for the fixed capacitor banks. It would have been obvious to one of ordinary skill in

the art at the time of applicant's invention to use a comb plate structure of Zerbini et al as a substitute for the capacitor plates of Yokota et al, since this type of plate structure is well known in the art as merely evidenced by Zerbini et al, to increase the capacitor plate area for better sensitivity. The overall shape of the inertial mass does not appear to add any unexpected result or operational feature that would patentably distinguish it over the rectangular shaped ring of Yokota et al, it being obvious to anyone skilled in the art that the mass could be any shape so long as the relationship of the electrode pairs is arranged, accordingly, to vary with motion in the desired sensing direction. The process-of-making limitations of claims 10, 16 and 21 do not change the structure of the apparatus and are therefore given no weight to the structure claimed. It is noted, however, that the structure of Yokota et al is etched.

7. Claims 2-4, 14 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al in view of Zerbini et al as applied to claims 1-3, 5-13, and 15-22 above, and further in view of Rich (US 6,257,062). Yokota et al in view of Zerbini et al, applied above, lacks the limitations of the fixed electrode being radially displaced from the inertial mass of claims 4 and 14; a specific teaching of an annular/elliptical shaped ring for the inertial mass of claims 2 and 3; and arguably, movable plates at the outer perimeter of claims 20-22. Rich shows an accelerometer with an annular ring shaped inertial mass that surrounds a central support 15 used to support the mass during fabrication. Four separate capacitor banks having plural plates are arranged at the outer periphery of the annular mass ring, and corresponding fixed electrodes are arranged "radially extended" from the inertial mass. Thus, Rich provides support for the position above that the inertial mass can be any shape, including annular. Further, it would have

been obvious to one of ordinary skill in the art at the time of applicant's invention to arrange the movable electrodes at the peripheral edge of the mass, and arrange the fixed electrodes radially with respect to the movable electrodes as shown in Rich. Even though Rich is directed to an annular accelerometer instead of a linear one, one of ordinary skill in the art is well aware of how to arrange the relative relationships between movable plates and fixed plates, and tethers to achieve a desired sensing direction. Thus, the particular geometrical arrangements become an obvious engineering expedient. Alternatively, given that the central support 15 of Rich is available to support the mass during fabrication, it would have been obvious to one skilled in the art, and having the teachings of Yokota et al and/or Zerbini et al, to utilize the central support of Rich to modify Rich to sense in another (linear) direction by tethering the mass to the support as taught in Yokota et al and Zerbini et al. One would be motivated to do this for providing a different sensing direction while obtaining the benefit of the central support during fabrication.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited shows sensors having an inertial mass supported from a central pedestal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C Hanley whose telephone number is 703-305-5130. The examiner can normally be reached on M-F 9AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 703-306-4705. The fax phone numbers for the organization where this application or proceeding

is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JCH
June 22, 2003

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800